

### **REMARKS/ARGUMENTS**

Applicants would like to thank the Examiner for the careful consideration given the present application. In particular Applicants would like to acknowledge an phone interview conducted with the Examiner on November 20, 2007, in which claims 1-19 were discussed. Applicants presented arguments in support of claims 1-19 over Sarvar et al.; however, no agreement was reached during the discussion. The Examiner agreed to review the reference and the application again and to perform another search.

In light of the final Office Action, the application has been carefully reviewed, and amended as necessary to place the application in condition for allowance.

Claims 1 – 12 and 14 – 16 are amended.

The specification was objected to, but in view of the amendments to the claims, the rejection is rendered moot. Accordingly, withdrawal is respectfully requested.

Claims 1 – 12 and 14 – 19 are rejected under 35 U.S.C. 101 for being directed to non-statutory subject matter. To further address this rejection, claim 1, from which claims 2 – 12 depend, and claim 14, from which claims 15 – 19 depend, have been amended to explicitly clarify that the second simulation result is displayed on a display device. Support for this amendment can be found throughout the specification – for example, on page 5, lines 16-19. Because claims 2 – 12 and 15 – 19 depend from claims 1 and 14, respectively, the amendments to claims 1 and 14 are also imparted on the claims depending therefrom.

According to the Office Action, it appears that the amendments to the claims should render the §101 rejection moot. However, in the event that it does not, Applicants maintain that simulation results are not abstract or intangible as they are used to model real world conditions, parameters, settings, etc. This is further evidenced by hundreds if not thousands of issued

patents that involve simulations, performing simulations, and the use of simulation results. Here, the simulation and simulation results are for a mounting process which is a real world process in the manufacture of circuitry. To name a few other patents, U.S. Patent No. 7,263,478 claims a system and method for performing a logic simulation of a circuit in order to verify a design via test patterns and obtaining results from such simulations (*e.g.*, simulated results); U.S. Patent No. 5,401,018 claims a baseball simulation system and method in which a baseball game is simulated; and U.S. Patent No. 7,257,525 claims systems and methods for simulating a circuit in which simulation results are obtained by performing simulations.

As established by *Eolas Technologies Inc. v. Microsoft Corp.*, software alone constitutes patentable subject matter. That is, software produces a useful, concrete, and tangible result. This holds true regardless of the type or purpose of the software. Thus, claims 1–12 and 14 constitute statutory subject matter, and withdrawal of the rejection is respectfully requested.

Claims 1 – 12 and 14 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarvar et al. – *Effective Modeling of the Reflow Soldering Process: Basis, Construction, and Operation of a Process Model*. Applicants respectfully disagree for at least the following reasons. In this invention, the respective steps constituting a mounting operation (*e.g.*, PRINTING, MOUNTING, REFLOW) are successively simulated. Amended claims 1 and 14 recite in part that the first simulation executing step and the second simulation executing step are directed to different steps in the plurality of steps composing the mounting process. On the other hand, in Sarvar et al., only the step of REFLOW is simulated. Thus, Sarvar et al. does not teach or suggest that the first simulation executing step and the second simulation executing step are directed to different steps in the plurality of steps composing the mounting process.

Moreover, the simulation result in Sarvar et al. is not provided from a different step to a different step (e.g., MOUNTING to REFLOW).

Further, Applicants maintain that Sarvar et al. does not teach or suggest executing a simulation based on a first condition selected for a first step; ...selecting a simulated result from the first simulation executing step as a simulation condition for a second step; and ...executing a simulation of the second step based on a second condition comprising the simulation condition and at least a third condition that yields a second simulation result. Rather, Sarvar et al. teaches simulating peak temperature based on specific heat data which is empirically derived.

The Examiner disagrees and states that the specific heat data is simulated and is then used as the first simulation condition in order to obtain a second simulation result: peak temperatures. According to the Office Action, the Examiner contends that the specific heat capacity ( $C_p$ ) data is not empirically derived but that this data “may be calculated” (i.e., simulated) using an interpolation calculation (e.g., 20080116, p. 5, paragraph 6a). Further, the Examiner states that Applicants have allegedly admitted that a calculation is evidence of a simulation based on claim 3 (or p. 4 of the specification). Applicants respectfully disagree with the Examiner’s characterization or interpretation of claim 3.

Claim 3 recites that the analysis result data are generated at every step based on a plurality of conditions which were previously simulated, and the second simulation executing step executes *the simulation of the second step by executing an interpolation calculation using the analysis result data simulated* based on a preceding or succeeding condition of the second condition. Thus, in claim 3, the interpolation calculation uses simulated data in order to yield a simulated result in the second simulation step. That is, the data used for the interpolation calculation is not empirically derived. By contrast, Sarvar et al. uses empirically derived data in

the interpolation calculation, thus yielding empirically derived results. The Office Action also acknowledges that Sarvar et al. discloses the calculation of heat capacity values based on empirical results (data) (Paper No. 20080116; p. 2, paragraph 3ii).

Furthermore, Sarvar et al. states that “a substantial program was established to empirically determine the Cp values for a selection of FR4 substrates and epoxy molded components...” (p. 129). Just below this, Sarvar et al. states that “the Cp was derived for each of the materials making up a PCA from samples analyzed with a calibrated Mettler TA3000 DSC. The instrument measures the heat flow into a sample and compares it to a reference standard material. Such a heat flow is directly proportional to the Cp of the substance...” Thus, the Cp (specific heat data) is empirically derived and is not simulated according to a simulation condition.

On p. 132 of Sarvar et al., under paragraph B, Sarvar et al. states that “the model of the populated PCA was constructed using empirically derived Cp values such as those in Fig. 7 ...” Hence, Sarvar et al. makes it abundantly clear that the specific heat data (Cp) is empirically or experimentally derived or determined and that the peak temperatures are simulated. For similar reasons as discussed above, Sarvar et al. fails to teach or suggest executing a simulation of the second step based on a second condition, wherein the *second condition comprises the simulation condition and at least a third condition* in order to yield a second simulation result, as recited in the rejected claims.

Hence, Sarvar et al. fails to teach or suggest each and every element as set forth in the claim, and therefore the claimed invention would not have been obvious to one of ordinary skill in the art in view of Sarvar et al. Accordingly, the rejection against claims 1 – 12 and 14 – 19 should be withdrawn.

Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Sarvar et al. Withdrawal of the rejection is respectfully requested for at least the following reasons. As discussed above in greater detail, the specific heat data is not simulated but is in fact, explicitly described in Sarvar et al. as being empirically determined or empirically derived. Therefore, each and every element of claim 13 is not anticipated by Sarvar et al.

More specifically, Sarvar et al. does not teach a mounting process simulation system that includes, among other things, an executing portion for executing the simulation based on condition input from the inputting portion wherein the executing portion includes a simulation result outputting portion that executes the simulation of the second step based on condition data from the condition table *and* a condition input from the inputting portion. The second simulation is based on two conditions – one from the condition table and one from the inputting portion. Contrary to claim 13, Sarvar et al. relates to empirically deriving varying specific heat capacity values and then simulating a peak temperature based on each empirically derived value. Thus, Sarvar et al. clearly fails to anticipate the rejected claim 13.

In light of the foregoing, it is respectfully submitted that the present application is in condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. NGB-36409.

Respectfully submitted,  
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